

Appl. No. 10/085,061
Amdt. dated January 20, 2006
Reply to Office action of September 20, 2005
Atty. Docket No. AP1107US

Amendments to the Drawings:

The replacement sheet of drawings includes changes to Figure 1. This sheet, which includes Figures 1 and 2, replaces the original sheet which included Figures 1 and 2. In amended Figure 1, the letter "k" has been replaced by the letter "n" (four occurrences). In Figure 2, the symbol $S_1'(k)$ has been inserted.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

The replacement sheet and annotated sheet have been labelled "Replacement Sheet" and "Annotated Sheet" as per 37 C.F.R. 1.84(p)(4).

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REMARKS/ARGUMENTS

The amendments to the Figures correct inconsistencies which are self-evident.

In paragraph 1 of the Office Action, the examiner pointed out two typographical errors. The amendments to the specification correct these errors. The other amendments to the specification correct a number of other errors of a typographical or clerical nature and correct certain ambiguities which came to light when the specification was being reviewed. For the most part, these amendments are self-explanatory. Paragraph [0009] has been amended to correspond to new claim 17, which replaces original claims 1, 2 and 3, which have been cancelled. The amendments to paragraphs 16, 17 and 19 to 23 change "k" to "n" in a number of places for consistency with Figure 2, in which the signature waveform is identified as "s(n)". Other amendments to paragraph 17 correct the description of Figure 1. No new subject matter has been added by these amendments.

In paragraph 7, the examiner indicated that claims 4-9, 11, 15 and 16 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Claims 4, 11 and 15 have been so rewritten as independent claims, so claims 4-9, 11, 15 and 16 are in allowable condition.

Claims 1 and 12, which were rejected by the examiner as anticipated by the admitted prior art, have been cancelled.

Claims 2, 10 and 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art and the disclosure by May *et al.* (EO 0 725510 A1). Claims 3 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art and the disclosure by May *et al.* (EO 0 725510 A1) and further in view of the disclosure by Gatherer *et al.* (US 6,366,555).

Claims 2 and 10 have been made dependent upon new claim 17, which replaces cancelled claim 1, and claim 13 has been made dependent upon new claim 21 which replaces cancelled claim 12. Claim 3 and 14 have been cancelled.

New claim 17 is directed to a method of effecting peak reduction in a DMT signal, comprising the steps of:

- (i) providing a predetermined signature waveform;
- (ii) for each frame of samples of the DMT signal, identifying a maximal value of amplitude (M) and the location (I) of said maximal value within said frame,
- (iii) comparing the maximal value with a threshold value and, if the maximal value is not less than the threshold value,
- (iv) multiplying the predetermined signature waveform by a scaling factor (C) to obtain a scaled signature waveform, and
- (v) subtracting said scaled signature waveform from said DMT signal frame so as to reduce said peak to a level substantially equal to said predetermined threshold value.

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Neither the acknowledged prior art nor either of the cited references by May *et al.* and Gatherer *et al.* discloses or suggests such a method of peak reduction involving the scaling of the signature waveform, using a scaling factor derived from the maximal value of the DMT signal frame whose peak value is being reduced, so as to reduce the peak value to the desired threshold.

May *et al.*'s disclosure (EP0725510) discloses several few different ways for PAR reduction, only one of which is related to the method according to the present invention, namely the time domain subtraction; others are related to frequency-domain constellation altering. In relation to the time domain subtraction, May *et al.* merely mention, in general, that magnitude adjustment has to be done. There is no mention of scaling the signature waveform and no specific disclosure of the way in which the signature waveform is obtained.


Also, in contrast with May *et al.*'s method, preferred embodiments of the present invention are not limited to using subchannels that are not being used by the DMT signal in order to obtain the signature waveform. As discussed in paragraphs [0028] and [0029] of the present application, all subchannels will be used in signature waveform calculation. Moreover, paragraph [0025] also sets a very unique time domain constraint which is never mentioned in May's patent.

Gatherer *et al.*'s disclosure (US636655B1) does not disclose scaling and, in so far as it discloses an iterative method, such method which would be very inefficient when implemented. It varies the signature waveform for every DMT signal when clipping happens, using the subchannels that are not being used, until clipping disappears for that particular DMT symbol. In embodiments of the present invention, the signature waveform is calculated once during modem initialization and will not change with the DMT symbol. Consequently, signature waveform calculation will not consume MIPS during the modem running time. Because only scaling and subtraction are needed during the running time, very little computation power is required. It is advantageous that signature waveform is signal independent and should be universally useful on the condition that the initial bit allocation is unchanged.

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In view of the foregoing, it is submitted that all claims of record are patentable over the acknowledged prior art and the cited references and early and favourable reconsideration of the application is respectfully requested.

Respectfully submitted,



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